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Tae-Kyun Kim

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EXAMINER

AKHAVANNIK, HADI

ART UNIT

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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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PAPER

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1, 6, 11, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (6700999) in view of Cho et al. (7146025, referred to as "Cho" herein)

Regarding claim 1, Yang discloses a face detection and tracking system for detecting and tracking a plurality of faces in real time from an input image, the system comprising: a background removing unit which extracts an area having a motion by removing the background image from the input image (column 2 line 65 to column 3 line 63, specifically see column 3 lines 51-63 as it discloses removing background);

a candidate area extracting unit which extracts a candidate area in which a face is possibly located in the area having a motion, by using a skin color probability map (P.sub.skin) generated from a face skin color model (column 2 lines 36-64 discloses creating a skin color map)

and the global probability map (P.sub.global) (column 4 line 40 to column 6 line 26 discloses using secondary probability information, such as face shape and size to ensure that a face has been selected for tracking);

and a face area tracking unit which tracks a face area according to a directional kernel indicating a probability that a face is located in a next frame, is based on the skin color probability map (see abstract and column 9 lines 12-64 as it discloses that this system is used for face tracking).

Yang does not explicitly disclose using ICA.

Cho discloses a face area determination unit which extracts independent component analysis (ICA) features from a candidate area and determines whether or not the candidate area is a face area (see column 3 lines 7-23 as it discloses that ICA is used to judge a face pattern. The vectors are then sent to a support vector machine).;

It would have been obvious at the time of the invention to one of ordinary skill in the art to include in Yang an ICA means as taught by Cho. The reason for the combination is because it makes for a more efficient system that can analyze the quality of image data by checking the vectors. Further both inventions are from the same field of endeavor of face recognition.

Regarding claim 6, Cho discloses that the ICA and SVM machine work together to detect the presence of a face in column 3 lines 6-23.

Regarding claim 11, please see the rejection of claim 1 above as it discloses all aspects of claim 11.

Regarding claim 16, please see the rejection of claim 6 as it discloses all aspects of claim 16.

Regarding claim 21, please see the rejection of claim 1 above as it discloses all aspects of claim 21.

2. Claim 8-9, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Cho in further view of Karmann et al. (5034986, referred to as "Karmann" herein)

Regarding claim 8, Yang discloses a plurality of sub-areas included in the second area that is not the background, and extracts each sub-area which includes the center of a sub-area included in the first area that is not the background, as areas that are not background, to remove the background image from the input image and extract an area having a motion (please see the rejection of claim 1 and column 3 lines 5-63 as it discloses extracting each sub-area at the center, which are not background by submasking the background regions).

Yang does not explicitly disclose that the background removing unit obtains a first area which is not a background, by using the brightness difference of the input image and a background image stored in advance, and obtains a second area which is not the background, by using the color difference of the two images

Karmann discloses this feature in column 3 lines 7-13 and 50-68, and also see column 10 lines 36-46 as it discloses using a previously stored brightness value to judge whether a current position is background or foreground.

It would have been obvious at the time of the invention to one of ordinary skill in the art to include in the combination of Yang and Cho a background selecting means as taught by Karmann. The reason for the combination is because it makes for a more robust system that is able to segment background from foreground regions. Further, all inventions are from the same field of endeavor of target recognition.

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Regarding claim 9, Karmann discloses the equation in claim 9 in column 6 line 60.

Regarding claims 18-19, please see the rejection of claims 8-9 above as they disclose all aspects of claims 18-9.

Allowable Subject Matter

3. Claims 2-5, 7, 12-15, 17 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 10 and 20 are allowed.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Atick et al. (6111517, discloses a tracking means), Ray et al. (6940545, discloses a face tracking method), Kikuchi et al. (6298143, discloses a target tracking means).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hadi Akhavannik whose telephone number is 571-272-8622. The examiner can normally be reached on 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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